

WHAT IS CLAIMED IS:

1. A plate assembly for use in supporting a workpiece in a processing chamber while the workpiece is being processed in a vacuum, said plate assembly comprising:

an underlying plate, and a pad that is disposed on said plate for use in supporting the workpiece, said pad having an upper surface remote from said plate, and said pad having a plurality of recesses extending in the upper surface thereof, whereby the vacuum in the processing chamber can act through said recesses on the rear surface of a workpiece that is resting on the upper surface of the pad.

2. A plate assembly according to claim 1, wherein said plate and said pad together have the shape of a disc.

3. A plate assembly according to claim 1, wherein the recesses are grooves that extend across the upper surface of said pad from one side of the upper surface to the other.

4. A plate assembly according to claim 1, wherein the pad comprises a non-ferrous metal material.

5. A plate assembly according to claim 1, and further comprising support members extending upwardly from the upper surface of said pad at the periphery thereof for use in positioning the workpiece on the pad.

6. A plate assembly according to claim 5, wherein said support members comprise a flange and a fence, said flange having a first end protruding upwardly from the upper surface of said pad at one side thereof, a second end extending beneath said plate from the outer periphery toward the center of said plate, and an intermediate portion at which the flange is pivotally supported, and said fence extending along the periphery of the upper surface of said pad at a location diametrically across from the first end of said flange.

7. A processing apparatus including:

a processing chamber;

a vacuum system connected to said processing chamber so as to evacuate said chamber and thereby produce a vacuum atmosphere in said processing chamber;

a plate assembly disposed in said processing chamber for supporting a workpiece as the workpiece is being processed, said plate assembly including a plate, and a pad that is disposed on said plate, said pad having an upper surface remote from said plate, and said pad having a plurality of recesses extending in the upper surface thereof, whereby the vacuum atmosphere in the processing chamber can act through said recesses on the rear surface of a workpiece that is resting on the upper surface of the pad;

a lifter disposed in said processing chamber below said plate assembly, said lifter being movable vertically in said processing chamber; and
at least one lift pin extending vertically from said lifter and movable into and out of contact with the rear surface of a workpiece resting on said pad to

selectively raise and lower the workpiece from and onto said pad.

8. A processing apparatus according to claim 7, wherein said plate assembly includes a flange and a fence, said flange having a first end protruding upwardly from the upper surface of said pad at one side thereof, an intermediate portion at which the flange is pivotally supported, and a second end extending beneath said plate in the path of said lifter such that the first end of said flange moves horizontally in accordance with upward and downward movements of said lifter to guide a workpiece onto said pad, and said extending along the periphery of the upper surface of said pad at a location diametrically across from the first end of said flange to support the workpiece as the workpiece is guided onto said pad by the flange.

9. A processing apparatus according to claim 7, and further comprising a robot arm having a working range by which the robot arm can carry the workpiece from outside of the processing chamber to the vicinity of the plate assembly and from the vicinity of the plate assembly to the outside of the processing chamber.

10. A processing apparatus according to claim 9, wherein the robot arm has a bifurcated free end.

11. A processing apparatus according to claim 7, wherein said vacuum system is operative to produce a vacuum in the processing chamber of less than 1.0×10^{-3} Torr.

12. A processing apparatus according to claim 7, wherein said plate and said pad together have the shape of a disc.

13. A processing apparatus according to claim 7, wherein said recesses are grooves that extend across the upper surface of said pad from one side of the upper surface to the other.

14. A processing apparatus according to claim 7, wherein the pad of said plate assembly comprises a non-ferrous metal material.

15. A processing apparatus according to claim 7, wherein the processing apparatus has at least two of said lifter pins.

16. A processing apparatus according to claim 7, and further comprising an upper electrode disposed above said plate assembly in the processing chamber, and an electrical power source connected to said upper electrode and to said plate assembly.

17. A processing apparatus according to claim 7, and further comprising an ion source connected to said processing chamber.